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Journal of Food Processing and Preservation
Volume 38, Issue 4, August 2014, Pages 2027-2036

Physicochemical and biochemical properties of pepsin-solubilized collagen isolated from the integument of sea cucumber (Stichopus vastus) (Article)

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Abstract

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The integument (high collagen content) of sea cucumber Stichopus vastus is generally wasted after harvesting, whereas only its stomach and intestines are eaten in few Asian countries. Amino acid composition, thermal transition temperature (Tm), zeta potential, solubility, moisture absorption and retention capacities, proximate composition and morphology of pepsin-solubilized collagen (PSC) isolated from the integument of S.vastus were studied. Amino acid composition revealed that glycine was dominant in the isolated collagen. PSC was found to have an isoelectric pH of 4.67, good moisture absorption and retention capacity at higher humidity, a sharp effect of pH and NaCl concentration on solubility, and an inverse relationship between temperature and viscosity. PSC also showed the maximum Tm to be 37.3C, very high protein content and ultrastructural characteristics. Hence, the PSC has the potential to be used as a functional ingredient in food, cosmetics and nutraceutical products. © 2013 Wiley Periodicals, Inc.

Indexed keywords

Engineering controlled terms: Amino acids Solubility

Amino acid compositions
Biochemical properties
Functional ingredient
Inverse relationship
Moisture absorption
NaCl concentration
Nutraceutical products
Proximate compositions

Engineering main heading: Collagen

Species Index: Holothuroidea Stichopus

ISSN: 01458892
Source Type: Journal
Original language: English
DOI: 10.1111/jfpp.12180
Document Type: Article
Publisher: Blackwell Publishing Ltd

References (35)

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1 Abedin, M.Z., Karim, A.A., Ahmed, F., Latiff, A.A., Gan, C.-Y., Che Ghazali, F., Islam Sarker, M.Z.
isolation and characterization of pepsin-solubilized collagen from the integument of sea cucumber (stichopus vastus)
(2013) *Journal of the Science of Food and Agriculture*, 93 (5), pp. 1083-1088. Cited 11 times.
doi: 10.1002/jsfa.5854
View at Publisher

2 (2005) *Official Methods of Analysis of the Association of Official Analytical Chemists International*. Cited 65 times.
AOAC., 18th Ed., AOAC International, Gaithersburg, MD.

3 Asghar, A., Henrickson, R.L.
Chemical, biochemical, functional, and nutritional characteristics of collagen in food systems
(1982) *Advances in Food Research*, 28 (C), pp. 231-372. Cited 144 times.
doi: 10.1016/S0065-2628(08)60113-5
View at Publisher

4 Benjakul, S., Thiansilakul, Y., Visessanguan, W., Roytrakul, S., Kishimura, H., Prodpran, T., Meesane, J.
Extraction and characterisation of pepsin-solubilised collagens from the skin of bigeye snapper (Priacanthus tayenus and Priacanthus macracanthus)
(2010) *Journal of the Science of Food and Agriculture*, 90 (1), pp. 132-138. Cited 35 times.
http://www3.interscience.wiley.com/cgi-bin/fulltext/122671275/PDFSTART
doi: 10.1002/jsfa.3795
View at Publisher

5 Cao, H., Xu, S.-Y.
Purification and characterization of type II collagen from chick sternal cartilage
(2008) *Food Chemistry*, 108 (2), pp. 439-445. Cited 41 times.
doi: 10.1016/j.foodchem.2007.09.022
View at Publisher

6 Chen, L., Du, Y., Zeng, X.
Relationships between the molecular structure and moisture-absorption and moisture-retention abilities of carboxymethyl chitosan - II. Effect of degree of deacetylation and carboxymethylation
(2003) *Carbohydrate Research*, 338 (4), pp. 333-340. Cited 85 times.
doi: 10.1016/S0008-6215(02)00462-7
View at Publisher

Related documents

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(2012) Food Hydrocolloids

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Zhang, Y. , Hu, L. , Liu, W.
(2015) Journal of Chinese Institute of Food Science and Technology

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(2013) International Food Research Journal

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7 Cui, F.-x., Xue, C.-h., Li, Z.-j., Zhang, Y.-q., Dong, P., Fu, X.-y., Gao, X.
Characterization and subunit composition of collagen from the body wall of sea cucumber Stichopus japonicus

(2007) *Food Chemistry*, 100 (3), pp. 1120-1125. Cited 86 times.
doi: 10.1016/j.foodchem.2005.11.019

View at Publisher

8 Damodaran, S.
Amino acids, peptides, and proteins
(1996) *Food Chem*, pp. 321-429. Cited 433 times.
In, 3rd Ed. (O.R. Fennema, ed.) Marcel Dekker., New York, NY.

9 Foegeding, E.A., Lanier, T.C., Hultin, H.O.
Characteristics of edible muscle tissue
(1996) *Food Chem*, pp. 879-942. Cited 199 times.
In (O.R. Fennema, ed.) Marcel Dekker, New York, NY.

10 Giraud-Guille, M.-M., Besseau, L., Chopin, C., Durand, P., Herbage, D.
Structural aspects of fish skin collagen which forms ordered arrays via liquid crystalline states

(2000) *Biomaterials*, 21 (9), pp. 899-906. Cited 77 times.
doi: 10.1016/S0142-9612(99)00244-6

View at Publisher

11 Ikoma, T., Kobayashi, H., Tanaka, J., Walsh, D., Mann, S.
Physical properties of type I collagen extracted from fish scales of Pagrus major and Oreochromis niloticas

(2003) *International Journal of Biological Macromolecules*, 32 (3-5), pp. 199-204. Cited 202 times.
doi: 10.1016/S0141-8130(03)00054-0

View at Publisher

12 Jongjareonrak, A., Benjakul, S., Visessanguan, W., Tanaka, M.
Isolation and characterization of collagen from bigeye snapper (Priacanthus macracanthus) skin

(2005) *Journal of the Science of Food and Agriculture*, 85 (7), pp. 1203-1210. Cited 59 times.
doi: 10.1002/jsfa.2072

View at Publisher

13 Jongjareonrak, A., Benjakul, S., Visessanguan, W., Nagai, T., Tanaka, M.
Isolation and characterisation of acid and pepsin-solubilised collagens from the skin of Brownstripe red snapper (Lutjanus vitta)

(2005) *Food Chemistry*, 93 (3), pp. 475-484. Cited 167 times.
doi: 10.1016/j.foodchem.2004.10.026

View at Publisher

14 Kittiphattanabawon, P., Benjakul, S., Visessanguan, W., Nagai, T., Tanaka, M.

Characterisation of acid-soluble collagen from skin and bone of bigeye snapper (Priacanthus tayenus)

(2005) *Food Chemistry*, 89 (3), pp. 363-372. Cited 233 times.
doi: 10.1016/j.foodchem.2004.02.042

View at Publisher

15 Liu, Z., Oliveira, A.C.M., Su, Y.-C.

Purification and characterization of pepsin-solubilized collagen from skin and connective tissue of giant red sea cucumber (Parastichopus californicus)

(2010) *Journal of Agricultural and Food Chemistry*, 58 (2), pp. 1270-1274. Cited 45 times.
http://pubs.acs.org/doi/pdfplus/10.1021/jf9032415
doi: 10.1021/jf9032415

View at Publisher

16 Liu, Z., Su, Y., Zeng, M.

Amino acid composition and functional properties of giant red sea cucumber (Parastichopus californicus) collagen hydrolysates

(2011) *Journal of Ocean University of China*, 10 (1), pp. 80-84. Cited 7 times.
doi: 10.1007/s11802-011-1787-4

View at Publisher

17 LOWRY, O.H., ROSEBROUGH, N.J., FARR, A.L., RANDALL, R.J.

Protein measurement with the Folin phenol reagent.

(1951) *The Journal of biological chemistry*, 193 (1), pp. 265-275. Cited 242656 times.

View at Publisher

18 Masre, S.F., Yip, G.W., Sirajudeen, K.N.S., Ghazali, F.C.

Quantitative analysis of sulphated glycosaminoglycans content of Malaysian sea cucumber Stichopus hermanni and Stichopus vastus

(2012) *Natural Product Research*, 26 (7), pp. 684-689. Cited 4 times.
doi: 10.1080/14786419.2010.545354

View at Publisher

19 Montero, P., Borderias, J., Turnay, J., Leyzarbe, M.A.

Characterization of Hake (Merluccius Merluccius L.) and Trout (Salmo Irideus Gibb) Collagen

(1990) *Journal of Agricultural and Food Chemistry*, 38 (3), pp. 604-609. Cited 76 times.
doi: 10.1021/jf00093a004

View at Publisher

20 Montero, P., Jiménez-Colmenero, F., Borderìas, J.

Effect of pH and the presence of NaCl on some hydration properties of collagenous material from trout (Salmo irideus Gibb) muscle and skin

(1991) *Journal of the Science of Food and Agriculture*, 54 (1), pp. 137-146. Cited 47 times.
doi: 10.1002/jsfa.2740540115

View at Publisher

21 Nagai, T., Ogawa, T., Nakamura, T., Ito, T., Nakagawa, H., Fujiki, K., Nakao, M., (...), Yano, T.
Collagen of edible jellyfish exumbrella

(1999) *Journal of the Science of Food and Agriculture*, 79 (6), pp. 855-858. Cited 78 times.

22 Nagai, T., Worawattanamateekul, W., Suzuki, N., Nakamura, T., Ito, T., Fujiki, K., Nakao, M., (...), Yano, T.
Isolation and characterization of collagen from rhizostomous jellyfish (Rhopilema asamushi)

(2000) *Food Chemistry*, 70 (2), pp. 205-208. Cited 75 times.
doi: 10.1016/S0308-8146(00)00081-9

View at Publisher

23 Nagai, T., Araki, Y., Suzuki, N.
Collagen of the skin of ocellate puffer fish (Takifugu rubripes)

(2002) *Food Chemistry*, 78 (2), pp. 173-177. Cited 113 times.
doi: 10.1016/S0308-8146(01)00396-X

View at Publisher

24 Ribeiro, A.R., Barbaglio, A., Benedetto, C.D., Ribeiro, C.C., Wilkie, I.C., Carnevali, M.D.C., Barbosa, M.A.
New insights into mutable collagenous tissue: Correlations between the microstructure and mechanical state of a Sea-Urchin ligament

(2011) *PLoS ONE*, 6 (9), art. no. e24822. Cited 20 times.
http://www.plosone.org/article/fetchObjectAttachment.action?uri=info%3Adoi%2F10.1371%2Fjournal.pone.0024822&representation=PDF
doi: 10.1371/journal.pone.0024822

View at Publisher

25 Saito, M., Kunisaki, N., Urano, N., Kimura, S.
Collagen as the major edible component of sea cucumber (Stichopus japonicus)

(2002) *Journal of Food Science*, 67 (4), pp. 1319-1322. Cited 85 times.

View at Publisher

26 Trotter, J.A., Lyons-Levy, G., Thurmond, F.A., Koob, T.J.
Covalent composition of collagen fibrils from the dermis of the sea cucumber, Cucumaria frondosa, a tissue with mutable mechanical properties

(1995) *Comparative Biochemistry and Physiology -- Part A: Physiology*, 112 (3-4), pp. 463-478. Cited 53 times.
doi: 10.1016/0300-9629(95)02015-2

View at Publisher

27 Tzaphlidou, M.
The role of collagen and elastin in aged skin: An image processing approach

(2004) *Micron*, 35 (3), pp. 173-177. Cited 41 times.
doi: 10.1016/j.micron.2003.11.003

View at Publisher

28 Usha, R., Ramasami, T.
The effects of urea and n-propanol on collagen denaturation: Using DSC, circular dicroism and viscosity

(2004) *Thermochimica Acta*, 409 (2), pp. 201-206. Cited 85 times.
doi: 10.1016/S0040-6031(03)00335-6

View at Publisher

29 Vojdani, F.
Solubility
(1996) *Methods of Testing Protein Functionality*, pp. 11-60. Cited 108 times.
In (G.M. Hall, ed.) St. Edmundsbury Press, Bury St. Edmunds, Great Britain.

30 Wang, L., An, X., Yang, F., Xin, Z., Zhao, L., Hu, Q.
Isolation and characterisation of collagens from the skin, scale and bone of deep-sea redfish (Sebastes mentella)

(2008) *Food Chemistry*, 108 (2), pp. 616-623. Cited 91 times.
doi: 10.1016/j.foodchem.2007.11.017

View at Publisher

31 Wong, D.W.S.
(1989) *Mechanism and Theory in Food Chemistry*. Cited 167 times.
1st Ed., Springer, New York, NY. ISBN-10: 0442207530.

32 Woo, J.-W., Yu, S.-J., Cho, S.-M., Lee, Y.-B., Kim, S.-B.
Extraction optimization and properties of collagen from yellowfin tuna (Thunnus albacares) dorsal skin

(2008) *Food Hydrocolloids*, 22 (5), pp. 879-887. Cited 60 times.
doi: 10.1016/j.foodhyd.2007.04.015

View at Publisher

33 Zhang, Y., Liu, W., Li, G., Shi, B., Miao, Y., Wu, X.
Isolation and partial characterization of pepsin-soluble collagen from the skin of grass carp (Ctenopharyngodon idella)

(2007) *Food Chemistry*, 103 (3), pp. 906-912. Cited 135 times.
doi: 10.1016/j.foodchem.2006.09.053

View at Publisher

34 Zhao, Y.-H., Chi, Y.-J.
Characterization of collagen from eggshell membrane

(2009) *Biotechnology*, 8 (2), pp. 254-258. Cited 22 times.
http://scialert.net/qredirect.php?doi=biotech.2009.254.258&linkid=pdf
doi: 10.3923/biotech.2009.254.258

View at Publisher

35 Zhu, B.-W., Dong, X.-P., Zhou, D.-Y., Gao, Y., Yang, J.-F., Li, D.-M., Zhao, X.-K., (...), Yu, C.
Physicochemical properties and radical scavenging capacities of pepsin-solubilized collagen from sea cucumber Stichopus japonicus

(2012) *Food Hydrocolloids*, 28 (1), pp. 182-188. Cited 23 times.
doi: 10.1016/j.foodhyd.2011.12.010

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